

(4) I produced samples of polyurethane substrates derived from an aqueous urethane dispersion and samples of solvent-based polyurethane substrates described below.

(5) Samples of polyurethane substrates derived from an aqueous urethane dispersion were prepared from the following components:

| Component | Parts By Weight (pbw) |
|---|--------------------------|
| BAYHYDROL 121 (Bayer Chemical) | 100.0 |
| butyl carbitol | 10.0 |
| TRITON GR-7M (Rohm & Haas) | 0.2 |
| CX-100 polyaziridine resin (Zeneca Resins) | 0.8 |

A dispersion of the above materials was prepared, mixed, and wet cast using a conventional knife coater onto a polyester film at a thickness of 0.005". The cast film was dried for two minutes each at 150° F, 200° F and 300° F.

(6) Samples of solvent-based polyurethane substrates were prepared from the following components:

| Component | Parts By Weight (pbw) |
|----------------------------|--------------------------|
| PM Acetate | 27.41 |
| MIBK | 27.40 |
| D651-65 (Bayer) | 10.42 |
| D670-80 (Bayer) | 25.43 |
| DBTDL | 0.06 |
| DESMODUR Z-4470 (Bayer) | 31.1 |

A solution of the above materials was prepared, mixed, and wet cast using a conventional knife coater onto an acrylic resin coated polyester film at a thickness of 0.005". The cast film was dried for two minutes each at 150° F, 200° F and 300° F and 375° F to give a dried film.

(7) Polyurethane substrates derived from an aqueous urethane dispersion have much higher elongation and tear strength properties in comparison to solvent-based polyurethane substrates due to the unique structure of polyurethane substrates derived from an aqueous urethane dispersion. A solvent-based urethane is its own film forming agent and forms a resulting polyurethane film simply by solvent evaporation or drying. In contrast, water-based urethane dispersions require particle coalescence to form a polyurethane film. It is believed that polyurethane substrates derived from an aqueous urethane dispersion possess higher elongation and tear strength properties, compared to solvent-based polyurethane substrates, because polyurethane substrates derived from an aqueous urethane dispersion are formed from rubber-like colloidal particles, which coalesce to form a continuous film with an overall "springy" characteristic. Solvent-based polyurethane substrates are not formed from such rubber-like colloidal particles.

(8) Polyurethane substrates derived from an aqueous urethane dispersion can have an elongation of 100+% (i.e., the substrate can elongate to a length at least twice as long as an original length). Solvent-based polyurethane substrates typically have an elongation of less than about 20%.

(9) The solvent-based polyurethane substrates made according to paragraph 6 above had an average elongation of less than 5% when measured at 25 degrees Centigrade.

(10) I have found that there is usually at least a five-fold difference in elongation values when polyurethane substrates derived from an aqueous urethane dispersion are compared to solvent-based polyurethane substrates.

(11) I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and

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further that the statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issuing therefrom.

Date

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Dennis O. Falaas



Attorney No.: 07780.0772US01
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